

Through the early-to-mid 1950s, clear U.S. superiority in nuclear forces credibly accomplished both objectives of deterring a nuclear attack on itself and a conventional attack on its allies. The United States could threaten a nuclear attack on the Soviet Union with relative impunity--knowing damage to itself would be far less than that inflicted on the Soviets. Furthermore, the scale of the threatened punishment would be grossly disproportionate to any gains the Soviets could have hoped for by initiating aggression.

In the 1960s, as the Soviet capacity for both nuclear and conventional attack grew, the credibility of the threat of massive nuclear response to a conventional attack eroded, since the United States would incur tremendous damage from a Soviet nuclear response. In 1967, after five years of debate, the United States and its allies in the North Atlantic Treaty Organization (NATO) adopted the concept of "flexible response." This concept had two important goals: to improve the conventional balance, thereby reducing U.S. and NATO reliance on nuclear weapons to deter or cope with non-nuclear attack, and to increase the flexibility and selectivity of U.S. nuclear response options in the hope of limiting escalation while convincing the Soviet Union that the price of continued aggression was too high. In the view of many analysts and policymakers, the former goal has not been met; the Alliance continues to rely heavily on a nuclear response even to non-nuclear aggression on the part of the Soviet Union.

The strategic nuclear balance forms an important background for the credibility of NATO's policy of flexible response. It is also important for deterring the Soviets from escalating a conventional war to a nuclear conflict. Against this backdrop, the Soviets have been consistently expanding both their strategic offensive and defensive capabilities. Within the past 10 years, they have more than quadrupled the number of nuclear weapons in their strategic arsenal--although current levels are similar to that of the United States. Moreover, they currently have under way a substantial modernization effort that will produce a new generation of weapons systems in all areas of their forces.

Improved accuracy of Soviet ICBM forces has seriously diminished the prospects for survival of U.S. land-based missiles, and extensive Soviet efforts in air defense have undercut the prospects for the retaliatory capability of penetrating U.S. bomber forces against their

air defenses. In addition, the Soviets have an unmatched civil defense effort. They have an extensive network of bunkers hardened against nuclear effects to protect their leadership, and have also made extensive plans to evacuate and protect their general population. These efforts have increased the perception in the last several Administrations that the Soviets may believe they could preserve what they value in a nuclear exchange--particularly a limited one--while causing the United States to pay an unacceptable price.

Perspectives on Nuclear Force Requirements

Changes in the balance of forces and dynamics of deterrence have led to shifts in what policymakers now believe is necessary to deter Soviet aggression. General agreement still exists that the United States must retain some basic parity with the Soviet Union in total numbers of strategic forces to avoid the appearance of weakness. But the Soviets appear to have placed an increasingly high value on their military assets and on protecting their leadership in the event of nuclear war. Policymakers are concerned that they have taken this approach both to improve their effectiveness in fighting a war and as leverage for political coercion short of war. Thus, U.S. targeting plans--especially since 1979-1980--have increased the priority of Soviet nuclear forces, other military forces, and leadership centers as targets regardless of the level of conflict. 6/

This emphasis is largely responsible for U.S. plans to add more warheads and to make a greater proportion of warheads able to attack hardened targets. Plans have also stressed the need for survivable and flexible forces. Survivable forces reduce the leverage to the aggressor of conducting either a surprise attack or a prolonged war. 7/ Flexi-

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6. See D. Ball and J. Richelson, eds., *Strategic Nuclear Targeting* (Ithaca: Cornell University Press, 1986).
 7. In any conflict, the command, control, communications and intelligence (C³I) network of strategic forces bears some of the heaviest demands. Attack assessment, decision-making, and coordination are just some of its required functions. Strengthening C³I has been an important focus of the modernization program and is the subject of a forthcoming CBO staff working paper. See also Ashton Carter and others, eds., *Managing Nuclear Operations* (Washington, D.C.: The Brookings Institution, 1987).

ble forces allow the United States to respond appropriately to a variety of contingencies.

Efforts along these lines to strengthen deterrence precede the current Administration, as do many of the programs involved in current U.S. strategic modernization. The debate has sharpened, however, because of recent heavy investments in and future commitments to strategic forces, and because of the current Administration's statements that the Soviets have superiority in important strategic capabilities.

Disagreements Over Current U.S. Deterrence Strategy

Many analysts do not agree that changes in strategic doctrine, especially those accompanying demands for more and better weapons, are needed to deter nuclear war. Some even disagree that such changes enhance nuclear deterrence. One concern of these critics is that emphasis on investment in U.S. strategic nuclear forces erodes the goal of strengthening conventional forces. In their view, a commitment to conventional forces is of equal or greater importance in enhancing deterrence since, in a war, weakness in conventional forces could increase the chances for using nuclear weapons.

Another concern is that a strong focus on targeting an opponent's nuclear forces makes force requirements self-perpetuating if both sides follow this strategy. By the time the United States adds sufficient capability to attack promptly many Soviet missile silos, submarine and bomber bases, and hardened leadership and command centers, the Soviets may have hundreds of new mobile strategic missiles, which would require additional and completely different U.S. capabilities for targeting, such as additional bombers and bomber-carried weapons, or many low-altitude satellites and extensive re-targeting capabilities for ICBMs.

Nor is the issue simply one of resources. Targeting an opponent's forces presents potentially serious problems for controlling a crisis. For instance, the Administration and many military planners believe it is important to target Soviet ICBMs in response to a Soviet attack. They believe it would be imprudent to allow the Soviets to believe they could retain ICBMs--not used in an initial attack--as a secure reserve force or to threaten further attacks. This targeting strategy, however,

carries great risks. If a conflict was already under way, the Soviet Union would probably launch its remaining ICBMs once it learned of a U.S. retaliatory attack, thus increasing damage to the United States and expanding the size of the war.

To put it another way, a crisis between nuclear powers is less likely to arise if each nation has well-protected weapons systems, resulting in little incentive either for a potential aggressor to attack or for the defender to launch its missiles on warning of an attack. Placing priority on targeting nuclear forces creates continual stress for crisis stability. For instance, current plans to increase U.S. ability to target Soviet forces require the addition of large numbers of hard-target warheads. If the Soviets also deploy hard-target capability more widely, perhaps as a result of the U.S. increase, it could jeopardize U.S. efforts to deploy survivable forces, particularly to increase ICBM survivability.

The potential impact of these efforts can be illustrated with the small, mobile ICBM system the United States plans to deploy. The purpose of this system is to provide the United States with survivable land-based missiles, thus reducing both the incentive for the Soviets to attack and the pressure to "use or lose" the U.S. silo-based ICBM force. Opponents of the system argue that the SICBMs would not increase survivability because the Soviets could attack the system with close-in submarine-launched missiles (SLBMs), launched at the same time as Soviet ICBMs so that there would be no advance warning of the SLBM attack. The submarine-launched missiles would arrive much sooner than the ICBMs, allowing much less time for U.S. SICBM missiles to be dispersed, and greatly reducing their survivability.

Today, however, that sort of attack on the part of the Soviet Union would not make much military sense. Soviet submarine-launched missiles may be able to attack a softer target like SICBMs, but without hard-target capability they cannot attack the silo-based ICBMs--a much more formidable force in terms of retaliatory capability. In fact, a Soviet planner would be unwise to believe that the United States would be reluctant to launch its silo-based missiles in the face of actual nuclear detonations on American soil, were Soviet SLBMs to

attack U.S. SICBMs.^{8/} Therefore, under such a scenario, the Soviet planner would be virtually guaranteeing retaliation by one thousand multiple-warhead missiles for the benefit of destroying several hundred single-warhead ICBMs.

Whether that scenario would be so implausible in the future is, however, another issue. The addition of large quantities of hard-target capability to the Soviet submarine force, similar to current U.S. plans and simply a matter of time, may alter this trade-off in a most unfavorable way. This possibility emphasizes the risks some analysts see in U.S. deployments of hard-target warheads to target Soviet forces.

Proponents of hard-target capability counter that, even if the United States showed restraint in its deployment of hard-target capability, the Soviets would not and that the United States would then find itself in a position even weaker than today. The Soviets can currently threaten the survivability of the U.S. silo-based ICBM force without facing similar retaliation (unless the United States takes the risky step of launching its forces on-warning of attack). Opponents argue in turn that arms control should be the vehicle for addressing such concerns. They believe that it is possible to limit the numbers and types of weapons so that each side has relatively secure forces and that it would be in the interests of both countries to avoid expending more and more effort to achieve survivable forces.

This report cannot resolve these fundamental philosophical differences. Rather it presents options that are consistent with some differences in views. Nor does the paper try to measure directly the deterrent capability of the Administration's program or of alternatives to it. As this discussion suggests, deterrence involves nuances of strategy that cannot be measured. Instead, this report estimates the effects of different programs in terms of changes in strategic weapons inventories, a method of judging capabilities that is commonly used by the Department of Defense.

8. The silo-based missiles would be launched "under attack"--that is, after actual nuclear explosions on U.S. territory. This situation is different from launching "on warning" of a Soviet attack, which poses the possibility for error by U.S. radar warning facilities.



CHAPTER III

COSTS AND EFFECTS OF

THE ADMINISTRATION'S

MODERNIZATION PROGRAM

Three key goals seem to underlie the Administration's plans for continued modernization of strategic offensive forces: maintain a survivable triad, respond flexibly to a Soviet attack, and maintain a manned penetrating bomber.¹ Under reasonable assumptions about the Soviet Union's future plans for its force structure, this plan would alter the balance of forces between the United States and Soviet Union in a manner consistent with these goals, and would give strategic forces an increasing share of future defense budgets.

GOALS OF CONTINUED MODERNIZATION

The three goals serve to describe and organize Administration plans. While the goals did not originate with this Administration, it has clearly subscribed to them more than any recent Administration. As discussed in Chapter II, not all analysts agree with the goals; some hold quite different views on what is necessary and desirable for the posture of U.S. deterrent forces.

Maintain a Survivable Triad

To a large degree, the scope of the Administration's planned buildup is driven by an effort to maintain a survivable triad of strategic forces and thus to continue to foil Soviet efforts to defeat U.S. retaliatory capability. The United States currently relies on a triad of strategic nuclear forces--land-based ballistic missiles, bombers, and submarine-launched ballistic missiles. A survivable triad enhances deterrence in several ways. It complicates Soviet efforts in planning and executing an attack; with three types of forces, the Soviets cannot focus their

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1. The Administration also has key goals with respect to C³I and strategic defenses.

attack on one type. A survivable triad also lessens the value of Soviet success in putting one leg of the triad at risk. Thus, the Soviets cannot afford to concentrate all their research and development efforts on one problem. The triad also provides a hedge against an unforeseen technical failure of an entire weapons system.

In addition, some segments of the triad reinforce each other in the face of a Soviet attack. For example, because of the timing required in an attack, the bombers and ICBMs together are more survivable than either would be alone.^{2/} Finally, each component of the triad has unique strengths and weaknesses in terms of survivability, flexibility, endurance, and reliability of command and control (see Appendix A).

Respond Flexibly to a Soviet Attack

Another goal of the modernization program is to increase the numbers of weapons that could survive a Soviet attack, retaliate promptly against selected targets (emphasizing hardened Soviet strategic forces and leadership facilities), and endure for some time after an initial exchange of weapons. A Soviet attack against U.S. strategic forces--termed a counterforce attack--is generally considered the most demanding for a U.S. retaliatory response. Currently, U.S. weapons able to retaliate against this select group of hardened targets could be the least survivable in the event of a Soviet attack.

This goal reflects the belief that the Soviets most value their tools of control and power (that is, strategic forces and leadership facilities) and that therefore an effective response--at any level of conflict--must

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2. Once bombers on alert are airborne for a few minutes, they are extremely difficult to attack. If the Soviet Union attempted a quick attack with missiles from submarines near the U.S. coast, it would provide about 15 minutes in which the formidable U.S. silo-based ICBM force could be launched under confirmed attack but before ICBMs from the USSR could arrive to attack them. (Without hard-target capability, SLBMs could not attack ICBM silos.) Conversely, if the Soviet Union waited until its ICBMs arrived to begin barraging the bombers, most of the planes would survive, although they would still have to face Soviet air defenses. The synergism between the new, mobile ICBM systems and the silo-based ICBMs would be similar, since the dispersal area of the mobile force increases rapidly with time. Furthermore, the Soviets might have to make some trade-offs in barraging bombers and the mobile ICBMs, increasing the survivability of one or the other.

emphasize these targets, most of which are hardened. It further reflects the belief that any significant imbalance between Soviet ability to destroy these types of targets in the United States and U.S. ability to retaliate symmetrically weakens deterrence.

Maintain a Manned Penetrating Bomber

Because the Soviets have devoted considerable resources to building and operating air defense radars, missiles, and aircraft, the Administration planned a bomber modernization program to procure two new strategic bombers, the B-1 and Advanced Technology Bomber (ATB or B-2), to maintain bomber penetration capabilities while moving the older B-52 force away from penetrating missions. Current plans involve equipping these aircraft with cruise missiles that would be launched from bombers outside Soviet airspace and fly to their designated targets within the Soviet Union. Initially, the cruise missiles will be used in a mission that also involves bomber penetration with short-range weapons--a so-called shoot-penetrate role. By the mid-1990's, all B-52s will be in a pure standoff role; that is, carrying only cruise missiles. As the ATB is fielded, the B-1Bs will take on a shoot-penetrate role.

The Administration has placed a high priority on maintaining a manned penetrating bomber--the Advanced Technology Bomber--which is difficult to detect on radar and so should be better able to penetrate the Soviet Union, in the latter part of the century.

Although it is arguable whether having such a bomber is a distinct goal; neither of the above goals requires a manned penetrating bomber, per se. Bombers on alert, even current bombers, have excellent chances for survival in an initial Soviet attack on U.S. bomber bases. Similarly, large numbers of ALCMs--launched from nonpenetrating bombers--can provide a great deal of flexibility and hard-target capability for the retaliatory mission. The Administration, however, believes that manned bombers must penetrate the Soviet Union to accomplish certain missions.

One key mission that requires a manned bomber is to find and destroy mobile targets, such as mobile ICBMs. With current technology, locating and destroying these targets requires a human

search. According to the Commander-in-Chief of the Strategic Air Command, manned bombers are also useful for assessment of target damage and "mop-up" target coverage. In addition, bombers in general--and the stealth bomber in particular--could provide versatile conventional capability in the face of improving air defenses in potential areas of conflict.^{3/}

THE ADMINISTRATION'S MODERNIZATION PROGRAM FROM 1981 TO 1987

To support these goals, the Administration has undertaken a substantial buildup in U.S. strategic forces. Between fiscal years 1981 and 1987, the United States will have paid for procurement of:

- o 100 B-1B bombers;
- o 1,490 air-launched cruise missiles (ALCMs)--for a total of 1,739--and a classified number of advanced cruise missiles (ACMs);
- o 6 Trident submarines (for a total so far of 14) plus 21 new Trident II (D-5) missiles; and
- o 66 MX missiles (including test missiles).

At least one system has been procured for each leg of the triad, suggesting the importance to the Administration of the first goal: maintain a survivable triad. The ability to retaliate against hardened targets may also be enhanced by the purchase of 50 MX missiles, although they will be deployed in fixed silos. The Trident II missile--another system just entering procurement--will clearly support this goal as it is deployed, beginning in the late 1980s. Finally, the United States has also purchased the B-1B, a new manned penetrating bomber, consistent with its third goal.

3. Testimony of General Welch before the Senate Committee on Armed Services, *Department of Defense Authorization for Appropriations for 1987*, Part 4, pp. 1600-1601.

Quantitative measures of the buildup to date also bear out support for the three goals. Table 3 compares actual 1981 forces with actual 1987 forces, showing an increase in total warheads of 36 percent. Since actual deployment of a weapons system can follow procurement by several years, some of the systems bought in recent years are not yet in the force. In fact, the fourteenth Trident submarine--the system with the longest lead time--will not be deployed until September 1993. Thus, Table 4 shows a "funded" force that assumes everything purchased to date is in the inventory. Both funded and deployed forces show increases in total warheads in all three legs of the triad. Funded forces in 1987 have a total of about 3,000 more warheads than was the case in 1981--14,245 compared with 11,361. Growth in total warheads in the forces actually deployed is slightly greater but with lower absolute levels.

Growth in hard-target kill (HTK) capable warheads is much more pronounced than growth of total warheads, reflecting the importance of the second of the three goals. Hard-target warheads grow 123 percent from 1981 to 1987 in the funded forces--from 2,896 HTK-capable warheads to 6,463. Deployed forces show a slightly smaller

TABLE 3. DEPLOYED U.S. STRATEGIC FORCES: 1981 AND 1987

	ICBMs		SLBMs		Bombers		Total	
	1981	1987	1981	1987	1981	1987	1981	1987
Warheads	2,153	2,289	4,576	5,632	2,312	4,404	9,041	12,325
Hard-Target Kill (HTK) Capable Warheads	900	1,170	0	0	1,212	3,304	2,112	4,474
Percent Contribution to Total Triad								
HTK Warheads	43	26	0	0	57	74	n.a.	n.a.
Throwweight (In millions of pounds)	2.5	2.2	1.6	2.0	n.a.	n.a.	4.1	4.2

SOURCE: Congressional Budget Office based on data from the Department of Defense.

NOTE: n.a. = not applicable. These numbers represent inventory counts of weapons.

increase of about 112 percent in hard-target warheads--from 2,112 to 4,474.

While all legs of the triad grow, the percentage contribution of each leg changes during the 1981-1987 period. Among funded forces, HTK-capable warheads on bombers and land-based missiles increase significantly, but growth in sea-based HTK-capable warheads is most pronounced--reflecting the deployment of new Trident II warheads aboard the ninth through fourteenth Trident submarines. On the other hand, in the active deployed force, the sea-based component makes no contribution to HTK capability in either 1981 or 1987. Among the deployed forces, growth in the contribution of bomber HTK capability is most pronounced. Bombers carried about 57 percent of hard-target capability in 1981. By 1987, they carry about 75 percent of that capability, largely reflecting the installation of air-launched cruise missiles.

TABLE 4. FUNDED U.S. STRATEGIC FORCES: 1981 AND 1987

	ICBMs		SLBMs a/		Bombers b/		Total	
	1981	1987	1981	1987	1981	1987	1981	1987
Warheads	2,153	2,450	6,304	6,784	2,904	5,011	11,361	14,245
Hard-Target Kill (HTK) Capable Warheads	900	1,400	192	1,152	1,804	3,911	2,896	6,463
Percent Contribution to Total Triad								
HTK Warheads	31	22	7	18	62	60	n.a.	n.a.
Throwweight (In millions of pounds)	2.5	2.3	2.3	2.8	n.a.	n.a.	4.8	5.1

SOURCE: Congressional Budget Office based on data from the Department of Defense.

NOTE: n.a. = not applicable.

- a. New submarine-launched missiles (D-5) for the ninth to thirteenth funded Trident submarines will actually be procured through 1989. However, because the submarine is funded and the missiles will be available as the submarines are actually deployed, they are included here. They are counted as carrying 8 Mark 5 warheads; they could carry 12 Mark 4 warheads.
- b. CBO estimates 240 ACMs are funded through 1987 based on press reports and ALCM production rates.

U.S. AND SOVIET MODERNIZATION PLANS BEYOND 1987

Although the buildup to date has been substantial, both the United States and the Soviet Union have ambitious modernization plans for the future.

United States

Under the modernization plan, to support its three goals, the Administration would continue to procure several major weapons systems through the mid-to-late 1990s. While not all the details of the plan are available publicly, nor, in some cases have ultimate force levels been determined, this study assumes the modernization plan includes:

- o Deployment starting in the early 1990s of 500 new, single-warhead, small ICBMs (SICBMs) in a mobile basing mode designed to survive a Soviet attack with tactical warning;^{4/}
- o Deployment, by the mid-1990s, of 50 MX missiles on railroad cars to achieve survivability with strategic warning;
- o Deployment in the early to mid-1990s of 132 Advanced Technology Bombers ("stealth bombers") designed to penetrate the Soviet Union without being detected by radar;^{5/}
- o Deployment by the early 1990s of about 3,200 air-launched cruise missiles (ALCMs), with about 1,500 of those being Advanced Cruise Missiles (ACMs) that reportedly have greater range than earlier versions and are "stealthy" to air defense radars. Cruise missiles would be carried initially on B-52s

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4. Tactical warning is information from sensors that an attack was actually under way; ballistic missiles launched from the Soviet Union could begin destroying targets in about 30 minutes. The United States relies on a number of different sensors, space-based and ground-based, and on "dual-phenomenology," meaning independent confirmation from at least two sensors.
 5. For quantities and costs, see quote from Secretary of Defense Weinberger in the *Washington Post*, June 4, 1986, p. 16, and report of an independent assessment by the General Accounting Office in *Defense News*, April 14, 1986, p. 1.

and would eventually be carried on both B-52 and B-1B bombers;

- o Procurement through the mid-1990s of about 1,600 new nuclear short-range attack missiles (SRAM II) to replace the current aging missiles carried on penetrating bombers;
- o Continued procurement through 1993 of Trident submarines at the current rate of one per year to a total of 20, and deployment by 1996, on most Trident submarines of the new, larger, and more accurate Trident II (D-5) missile.^{6/}

Appendix A describes these systems in more detail.

Two characteristics of these new systems stand out. To some degree, all are mobile platforms, which should greatly enhance their survivability. Mobile platforms can move about over large areas, which makes them difficult to destroy. The second key characteristic is that all are hard-target capable weapons; these weapons would more than double the U.S. inventory of hard-target warheads by 1996.

Furthermore, modernizing all triad elements over a number of years would provide open production lines for manufacturing additional systems should that be necessary. Finally, modernization would decrease the average age of U.S. forces and equipment, presumably improving their reliability and maintainability. In 1996, for example, about 70 percent of bomber weapons would be carried by aircraft less than 15 years old, compared with less than 20 percent today.

Soviet Union

The Soviets also have ambitious modernization plans under way. They now are developing a follow-on missile to the SS-18 ICBM, and

6. The President's budget for fiscal years 1988 and 1989 reflects procurement of the nineteenth Trident submarine in 1992. See also testimony by Rear Admiral Williams before the Senate Committee on Armed Services, "Strategic Force Modernization Programs," October/November 1981, pp. 170 and 173, to the effect that Navy studies consistently lean toward two squadrons, each consisting of 10 submarines.

are introducing two new ICBMs--the mobile SS-25 and the SS-24, which is expected to be deployed in both fixed and rail-mobile modes. They also have two strategic nuclear submarines in production--the Typhoon and the Delta IV--and are developing modified versions of the SS-N-20 and SS-N-23 multiple-warhead SLBMs deployed on these submarines. A new type of submarine is expected in the 1990s. The Soviet bomber force is also being modernized. A new version of the older model Bear-H bomber that carries the cruise missile (the older model did not) is in production. Testing of the Blackjack-A bomber also continues, although the Blackjack's deployment has been slower than U.S. analysts anticipated.^{7/}

According to testimony by representatives of the Central Intelligence Agency (CIA), the number of deployed Soviet warheads is likely to grow to over 12,000 by 1990. If recent trends continue, the Soviets could deploy over 16,000 warheads by 1996, even if they maintained a moderate pace of modernization; a robust, but not maximum, pace of modernization could increase that number to over 21,000. DOD also projects that the Soviet ICBM force--the mainstay of their strategic forces--will be replaced almost entirely with new systems by the mid-1990s.^{8/} (See Appendix D for specific assumptions about Soviet forces.)

HOW THE BALANCE OF FORCES MIGHT CHANGE UNDER THE MODERNIZATION PLANS

Assuming a moderate pace of modernization by the Soviets, the U.S. buildup yields a shift in the balance of forces generally in keeping with the three key Administration goals discussed at the beginning of

7. The Backfire bomber is also in production, but is not usually considered a strategic bomber. It can reportedly be equipped for inflight refueling. The Soviets, however, reportedly have fewer than 100 aerial refueling tanker aircraft, although a new version has recently begun to be deployed. In contrast, the United States has over 600 tanker aircraft.
8. See "Soviet Strategic Force Developments," testimony of Robert M. Gates and Lawrence K. Gershwin, before a joint session of the Subcommittee on Strategic and Theater Nuclear Forces, Senate Committee on Armed Services, and the Defense Subcommittee, Senate Committee on Appropriations, June 26, 1985.



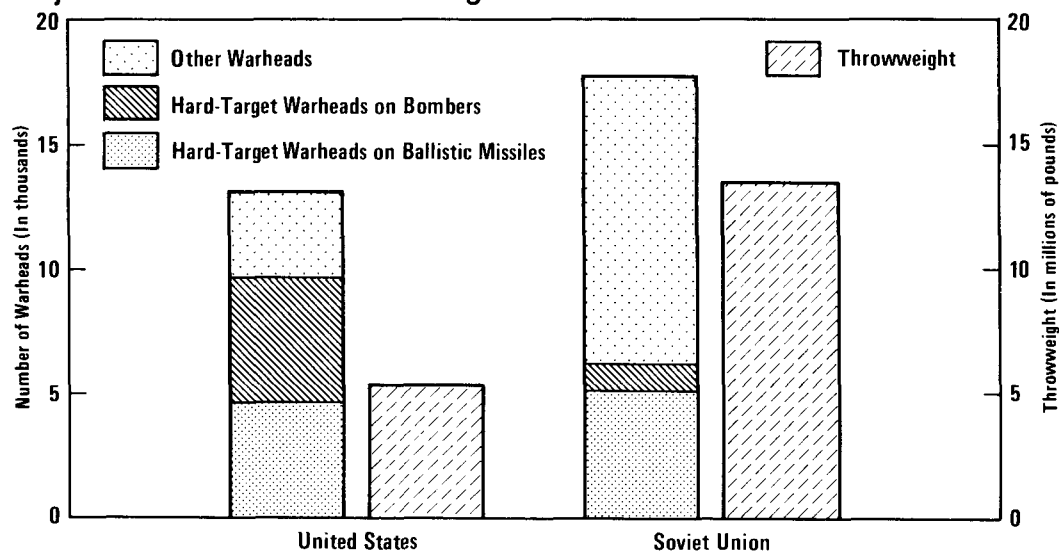
this chapter. The following review of quantitative measures of the future balance suggests this finding.

Pre-Attack Measures of Balance

Total Warheads. The rough balance of U.S. and Soviet warheads shifts in favor of the Soviet Union. As illustrated in Figure 4, by 1996 total numbers of U.S. on-line warheads will have increased from a 1987 level of about 11,200 to about 13,100. Assuming a pace of modernization consistent with recent efforts, total Soviet warheads will increase to about 17,700. Thus, the Soviets would have about 4,700 more warheads than the United States.

Hard-Target Warheads. While the balance of total warheads could shift in favor of the Soviet Union, the balance of hard-target warheads could shift in favor of the United States. U.S. hard-target warheads

Figure 4.
Projected U.S. and Soviet Strategic Forces in 1996



SOURCE: Congressional Budget Office estimates.

NOTE: Adjusted for on-line weapons.

would increase from about 4,100 in 1987 to about 9,600 by 1996, a growth of 134 percent. They would peak after 1996 at a level of about 11,600 as all Trident submarines were deployed, making a total increase of about 183 percent. This buildup in hard-target capability would occur largely because of the deployment of large numbers of cruise and SRAM II missiles on bombers and the deployment of Trident II missiles--the only hard-target capable missiles aboard submarines. The number of Soviet hard-target weapons could also increase significantly. Soviet hard-target warheads could increase from about 3,600 to about 6,000. By these measures, however, the United States would have substantially greater numbers of hard-target warheads by 1996.^{9/}

Numbers of hard-target warheads capable of being delivered promptly, which exclude those on bombers, would also shift in favor of the United States. U.S. numbers would increase from about 1,200 in 1987 to about 4,600 by 1996--an increase of 283 percent.^{10/} Soviet prompt hard-target warheads could increase from about 3,200 to about 5,000.

Other Measures. The Soviet advantage in throwweight would decrease from about 3-to-1 in 1987 to about 2.5-to-1.0 by 1996. It is unlikely to fall further unless the Soviet Union elects to retire its large land-based missiles (particularly SS-18s), which appears improbable. Also, both the United States and the Soviet Union would probably increase the number of hard-target warheads in fixed locations, and those warheads are the most vulnerable to a nuclear attack. As a percentage of total prompt hard-target warheads, however, they would decrease in the United States from 100 percent today to about

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9. These figures incorporate a different assumption about Soviet ICBM hard-target capability than an earlier CBO analysis. Public estimates indicate that the new SS-24 is not hard-target capable, as do recent public estimates of the SS-17 and SS-19 ICBM's capability. These estimates account for the fact that U.S. silos are reportedly only hardened to about 2,000 psi. More accurate versions of the SS-24 and SS-25 are expected, according to *Soviet Military Power*, but do not appear to be incorporated into projections of the Soviets' mid-1990s forces. A new "heavy ICBM" (an SS-18 follow-on) is projected for the mid-1990s.
 10. This total counts all SLBMs as prompt. This is a reasonable assumption for the most likely case of a Soviet attack with strategic warning.